

# Bare Printed Circuit Board Manufacturing: 2002

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## 2002 Economic Census

*Manufacturing*

Industry Series



U S C E N S U S B U R E A U

*Helping You Make Informed Decisions*

U.S. Department of Commerce  
Economics and Statistics Administration  
U.S. CENSUS BUREAU



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-- Not applicable for this report.

**Table 1. Historical Statistics for the Industry: 2002 and Earlier Years**

[Data based on the 2002 Economic Census and the 2002 Annual Survey of Manufactures (ASM). For information on confidentiality protection, sampling error, nonsampling error, and explanation of terms, see note at end of table. For meaning of abbreviations and symbols, see introductory text]

Industry and year <sup>1</sup>	Com- panies <sup>2</sup>	All estab- lish- ments <sup>3</sup>	All employees		Production workers			Value added (\$1,000)	Total cost of materials (\$1,000)	Total value of shipments (\$1,000)	Total capital expendi- tures (\$1,000)	
			Number <sup>4</sup>	Payroll (\$1,000)	Number <sup>4</sup>	Hours (1,000)	Wages (\$1,000)					
334412, Bare printed circuit board manufacturing .....	2002..	878	936	46 890	1 653 179	33 226	73 354	940 695	3 373 527	2 718 114	6 128 781	263 236
	2001..	N	N	72 333	2 359 198	55 644	107 567	1 522 882	4 729 574	4 484 395	9 413 636	575 807
	2000..	N	N	85 120	2 982 541	68 393	146 374	2 029 598	6 626 768	6 073 410	12 532 074	738 783
	1999..	N	N	81 416	2 661 239	65 239	137 886	1 798 136	5 557 074	4 413 171	9 832 103	687 556
	1998..	N	N	78 774	2 395 819	62 507	130 783	1 573 304	5 047 653	4 144 473	9 144 266	747 589
	1997..	1 319	1 391	72 282	2 110 176	56 173	113 963	1 345 948	5 062 300	3 486 866	8 507 125	609 125

<sup>1</sup>Statistics presented for years ending in 2 and 7 are census data. Interim census years are derived in a representative sample of manufacturing establishments canvassed in the Annual Survey of Manufactures (ASM).

<sup>2</sup>For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

<sup>3</sup>Includes establishments with payroll at any time during the year.

<sup>4</sup>Number of employees figures represent average number of production workers for pay period that includes the 12th of March, May, August, and November plus other employees for payroll period that includes the 12th of March.

Note: The data in this table are based on the 2002 Economic Census and the 2002 Annual Survey of Manufactures (ASM). To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain sampling errors and nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.

**Table 2. Industry Statistics for Selected States: 2002**

[States that are a disclosure or with less than 100 employees are not shown. Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, explanation of terms, and geographical definitions, see note at end of table. For information on geographic areas followed by \*, see Appendix D. For meaning of abbreviations and symbols, see introductory text]

Industry and geographic area	E <sup>1</sup>	All establishments <sup>2</sup>		All employees		Production workers			Value added (\$1,000)	Total cost of materials (\$1,000)	Total value of shipments (\$1,000)	Total capital expenditures (\$1,000)
		Total	With 20 employees or more	Number <sup>3</sup>	Payroll (\$1,000)	Number <sup>3</sup>	Hours (1,000)	Wages (\$1,000)				
<b>334412, Bare printed circuit board manufacturing</b>												
United States .....	1	936	390	46 890	1 653 179	33 226	73 354	940 695	3 373 527	2 718 114	6 128 781	263 236
Alabama .....	—	7	6	716	29 128	408	1 245	12 050	84 433	47 527	131 778	6 000
Arkansas .....	—	5	1	318	9 174	190	355	4 021	21 184	22 873	45 328	428
California .....	2	264	102	10 444	388 671	7 944	18 309	244 798	719 210	621 911	1 360 327	64 602
Colorado .....	2	27	7	479	17 304	348	710	10 066	35 940	18 171	54 072	3 270
Connecticut .....	—	18	7	1 105	42 773	900	2 347	33 935	93 507	66 449	162 224	12 539
Florida .....	—	31	10	2 097	75 165	1 421	2 724	38 069	155 412	155 085	311 621	15 204
Georgia .....	1	11	6	911	30 515	515	1 022	12 343	81 972	44 407	120 026	1 945
Illinois .....	1	64	30	2 313	68 156	1 827	4 220	41 137	140 972	94 749	235 504	14 824
Massachusetts .....	—	50	24	3 384	119 137	2 077	4 599	68 117	214 562	294 060	513 388	13 861
Michigan .....	2	23	10	1 118	34 623	823	1 763	19 116	70 369	67 933	136 792	7 271
Minnesota .....	—	44	25	2 687	87 907	1 833	3 942	44 453	208 486	139 140	352 041	25 118
New Hampshire .....	—	14	11	2 930	124 580	1 734	4 073	56 381	118 811	311 786	426 910	24 788
New Jersey .....	4	19	7	308	9 821	247	613	6 479	18 382	15 085	34 335	1 524
New York .....	—	49	16	3 513	121 539	2 210	4 773	56 862	291 961	169 703	465 281	6 169
North Carolina .....	4	15	1	194	6 050	160	259	4 227	10 705	6 282	17 293	747
Oklahoma .....	2	9	3	176	5 219	136	406	3 024	9 774	6 166	15 967	335
Oregon .....	—	15	5	1 585	61 645	1 125	1 601	31 600	115 626	67 192	177 430	13 017
Pennsylvania .....	2	28	9	799	24 077	634	1 462	15 402	39 394	25 096	63 964	1 371
Texas .....	3	57	17	1 259	44 804	909	2 279	25 795	96 619	54 245	147 709	8 438
Utah .....	—	13	5	1 092	29 623	713	1 288	16 812	45 385	49 452	98 118	1 248
Virginia .....	1	8	5	307	9 981	234	517	6 188	21 113	8 083	29 130	1 493
Washington .....	1	22	12	976	34 264	849	1 778	27 151	61 610	39 125	102 312	6 916
Wisconsin .....	6	14	9	1 523	53 087	1 139	2 272	32 925	100 126	64 796	163 888	9 326

<sup>1</sup>Some payroll and sales data for small single-establishment companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate statistics for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown where estimated data account for 10 percent or more of the figures shown: 1–10 to 19 percent; 2–20 to 29 percent; 3–30 to 39 percent; 4–40 to 49 percent; 5–50 to 59 percent; 6–60 to 69 percent; 7–70 to 79 percent; 8–80 to 89 percent; 9–90 percent or more.

<sup>2</sup>Includes establishments with payroll at any time during the year.

<sup>3</sup>Number of employees figures represent average number of production workers for pay period that includes the 12th of March, May, August, and November plus other employees for payroll period that includes the 12th of March.

Note: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C. For geographical definitions, see Appendix D.

# Table 3. Detailed Statistics by Industry: 2002

[Data based on the 2002 Economic Census and the 2002 Annual Survey of Manufactures (ASM). For information on confidentiality protection, sampling error, nonsampling error, and explanation of terms, see note 2 at end of table. For meaning of abbreviations and symbols, see introductory text]

Item	Value
<b>334412, Bare printed circuit board manufacturing</b>	
Companies <sup>1</sup> .....	number.. 878
All establishments <sup>2</sup> .....	number.. 936
Establishments with 1 to 19 employees .....	number.. 546
Establishments with 20 to 99 employees .....	number.. 290
Establishments with 100 employees or more .....	number.. 100
All employees <sup>3</sup> .....	number.. 46 890
Total compensation .....	\$1,000.. 2 009 260
Annual payroll .....	\$1,000.. 1 653 179
Total fringe benefits .....	\$1,000.. 356 081
Production workers, average for year .....	number.. 33 226
Production workers on March 12 .....	number.. 34 120
Production workers on May 12 .....	number.. 33 767
Production workers on August 12 .....	number.. 32 981
Production workers on November 12 .....	number.. 31 997
Production worker hours .....	\$1,000.. 73 354
Production worker wages .....	\$1,000.. 940 695
Total cost of materials .....	\$1,000.. 2 718 114
Materials, parts, containers, packaging, etc., used .....	\$1,000.. 2 431 736
Resales .....	\$1,000.. 86 313
Purchased fuels .....	\$1,000.. 22 047
Purchased electricity .....	\$1,000.. 100 220
Contract work .....	\$1,000.. 77 798
Quantity of electricity purchased for heat and power .....	1,000 kWh.. 1 349 655
Quantity of electricity generated less sold for heat and power .....	1,000 kWh.. -
Total value of shipments .....	\$1,000.. 6 128 781
Primary products value of shipments .....	\$1,000.. 5 659 584
Secondary products value of shipments .....	\$1,000.. 290 848
Total miscellaneous receipts .....	\$1,000.. 178 349
Value of resales .....	\$1,000.. 95 468
Contract receipts .....	\$1,000.. 67 852
Other miscellaneous receipts .....	\$1,000.. 15 029
Primary products specialization ratio .....	percent.. 95
Value of primary products shipments made in all industries .....	\$1,000.. 6 457 495
Value of primary products shipments made in this industry .....	\$1,000.. 5 659 584
Value of primary products shipments made in other industries .....	\$1,000.. 797 911
Coverage ratio .....	percent.. 88
Value added .....	\$1,000.. 3 373 527
Total inventories, beginning of year .....	\$1,000.. 748 029
Finished goods inventories .....	\$1,000.. 100 128
Work-in-process inventories .....	\$1,000.. 254 125
Materials and supplies inventories .....	\$1,000.. 393 776
Total inventories, end of year .....	\$1,000.. 634 517
Finished goods inventories .....	\$1,000.. 108 284
Work-in-process inventories .....	\$1,000.. 208 829
Materials and supplies inventories .....	\$1,000.. 317 404
Gross value of depreciable assets (acquisition costs) at beginning of year .....	\$1,000.. 3 751 778
Total capital expenditures (new and used) .....	\$1,000.. 263 236
Buildings and other structures (new and used) .....	\$1,000.. 28 360
Machinery and equipment (new and used) .....	\$1,000.. 234 876
Automobiles, trucks, etc., for highway use .....	\$1,000.. 12 316
Computers and peripheral data processing equipment .....	\$1,000.. 22 053
All other expenditures for machinery and equipment .....	\$1,000.. 200 507
Total retirements .....	\$1,000.. 279 449
Gross value of depreciable assets at end of year .....	\$1,000.. 3 735 565
Depreciation charges during year .....	\$1,000.. 351 537
Total rental payments .....	\$1,000.. 117 316
Buildings and other structures .....	\$1,000.. 74 218
Machinery and equipment .....	\$1,000.. 43 098
Total other expenses <sup>4</sup> .....	\$1,000.. 463 397
Response coverage ratio <sup>5</sup> .....	percent.. 68
Repair and maintenance services of buildings and/or machinery <sup>4</sup> .....	\$1,000.. 63 768
Communications services <sup>4</sup> .....	\$1,000.. 13 613
Legal services <sup>4</sup> .....	\$1,000.. 10 633
Accounting, auditing, and bookkeeping services <sup>4</sup> .....	\$1,000.. 5 087
Advertising and promotional services <sup>4</sup> .....	\$1,000.. 5 776
Expensed computer hardware and supplies and purchased computer services <sup>4</sup> .....	\$1,000.. 11 426
Refuse removal (including hazardous waste) services <sup>4</sup> .....	\$1,000.. 14 289
Management consulting and administrative services <sup>4</sup> .....	\$1,000.. 14 148
Taxes and license fees <sup>4</sup> .....	\$1,000.. 14 774
All other expenses <sup>4</sup> .....	\$1,000.. 309 883

<sup>1</sup>For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

<sup>2</sup>Includes establishments with payroll at any time during the year.

<sup>3</sup>Number of employees figures represent average number of production workers for pay period that includes the 12th of March, May, August, and November plus other employees for payroll period that includes the 12th of March.

<sup>4</sup>Based on Annual Survey of Manufactures (ASM) sample data.

<sup>5</sup>A response coverage ratio is derived for this item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight) for those Annual Survey of Manufactures (ASM) establishments that reported to the weighted total employment for all ASM establishments classified in this industry.

Note 1: The amounts shown for other expenses reflect only those services that establishments purchase from other companies.

Note 2: The data in this table are based on the 2002 Economic Census and the 2002 Annual Survey of Manufactures (ASM). To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain sampling errors and nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.

**Table 4. Industry Statistics by Employment Size: 2002**

[Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, and explanation of terms, see note at end of table. For meaning of abbreviations and symbols, see introductory text]

Employment size class	E <sup>1</sup>	All establishments <sup>2</sup>	All employees		Production workers			Value added (\$1,000)	Total cost of materials (\$1,000)	Total value of shipments (\$1,000)	Total capital expenditures (\$1,000)
			Number <sup>3</sup>	Payroll (\$1,000)	Number <sup>3</sup>	Hours (1,000)	Wages (\$1,000)				
334412, Bare printed circuit board manufacturing											
All establishments .....	1	936	46 890	1 653 179	33 226	73 354	940 695	3 373 527	2 718 114	6 128 781	263 236
Establishments with—											
1 to 4 employees .....	9	263	550	18 012	436	871	11 094	37 925	24 792	62 713	4 447
5 to 9 employees .....	6	152	1 015	37 589	798	1 924	23 332	96 009	65 240	165 652	8 358
10 to 19 employees .....	5	131	1 853	68 083	1 332	2 971	36 853	157 040	91 055	248 350	13 000
20 to 49 employees .....	3	182	5 702	193 119	4 333	10 695	117 356	430 853	294 802	722 876	35 830
50 to 99 employees .....	1	108	7 678	249 964	5 561	13 080	143 970	481 452	376 920	856 335	33 048
100 to 249 employees .....	—	59	8 874	321 155	6 365	14 153	181 132	628 524	428 866	1 062 028	52 934
250 to 499 employees .....	—	27	9 426	345 574	6 649	14 836	218 243	566 133	666 783	1 267 989	56 445
500 to 999 employees .....	1	12	i	D	D	D	D	D	D	D	D
1,000 to 2,499 employees .....	—	2	h	D	D	D	D	D	D	D	D
2,500 employees or more .....	—	—	—	—	—	—	—	—	—	—	—
Administrative records <sup>4</sup> .....	6	363	1 390	46 436	1 108	2 240	28 755	158 351	100 910	259 172	11 973

<sup>1</sup>Some payroll and sales data for small single-establishment companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate statistics for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown where estimated data account for 10 percent or more of the figures shown: 1—10 to 19 percent; 2—20 to 29 percent; 3—30 to 39 percent; 4—40 to 49 percent; 5—50 to 59 percent; 6—60 to 69 percent; 7—70 to 79 percent; 8—80 to 89 percent; 9—90 percent or more.

<sup>2</sup>Includes establishments with payroll at any time during the year.

<sup>3</sup>Number of employees figures represent average number of production workers for pay period that includes the 12th of March, May, August, and November plus other employees for payroll period that includes the 12th of March.

<sup>4</sup>Some payroll and sales data for small single-establishment companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate statistics for these small establishments. Data are also included in respective size classes shown.

Note: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C. For geographical definitions, see Appendix D.

**Table 5. Industry Statistics by Primary Product Class Specialization: 2002**

[Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, and explanation of terms, see note at end of table. For meaning of abbreviations and symbols, see introductory text]

Industry or product class code	Industry or primary product class	All establishments <sup>1</sup>	All employees		Production workers			Value added (\$1,000)	Total cost of materials (\$1,000)	Total value of shipments (\$1,000)	Total capital expenditures (\$1,000)
			Number <sup>2</sup>	Payroll (\$1,000)	Number <sup>2</sup>	Hours (1,000)	Wages (\$1,000)				
334412	Bare printed circuit board manufacturing .....	936	46 890	1 653 179	33 226	73 354	940 695	3 373 527	2 718 114	6 128 781	263 236
3344120	Bare printed circuit boards .....	936	46 890	1 653 179	33 226	73 354	940 695	3 373 527	2 718 114	6 128 781	263 236

<sup>1</sup>Includes establishments with payroll at any time during the year.

<sup>2</sup>Number of employees figures represent average number of production workers for pay period that includes the 12th of March, May, August, and November plus other employees for payroll period that includes the 12th of March.

Note: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.

Table 6a. **Products Statistics: 2002 and 1997**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, and explanation of terms, see note 2 at end of table. For meaning of abbreviations and symbols, see introductory text]

Product code	Product	Number of companies with shipments of \$100,000 or more	Quantity of production for all purposes	Product shipments	
				Quantity	Value (\$1,000)
334412	Bare printed circuit board manufacturing .....	2002.. N	X	X	6 457 495
	1997.. N	N	X	X	8 724 756
3344120	Bare printed circuit boards .....	2002.. N	X	X	6 457 495
	1997.. N	N	X	X	8 724 756
33441201	Bare printed circuit (wiring) boards .....	2002.. N	X	X	5 794 762
	1997.. N	N	X	X	7 827 892
3344120100	Bare printed circuit (wiring) boards <sup>1</sup> .....	2002.. 366	X	X	5 794 762
	1997.. 534	N	X	X	7 827 892
3344120Y	Bare printed circuit boards, nsk, total .....	2002.. N	X	X	662 733
	1997.. N	N	X	X	896 864
3344120YWW	Bare printed circuit boards, nsk, for nonadministrative-record establishments .....	2002.. N	X	X	507 509
	1997.. N	N	X	X	582 894
3344120YWY	Bare printed circuit boards, nsk, for administrative-record establishments .....	2002.. N	X	X	155 224
	1997.. N	N	X	X	313 970

<sup>1</sup>For additional detail, see Current Industrial Report MA334Q, Semiconductors and Electronic Components.

Note 1: For some establishments, data have been estimated from central unit values that are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: p-10 to 19 percent estimated; q-20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by S.

Note 2: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.



Table 6b. **Product Class Shipments for Selected States: 2002 and 1997**

[Not applicable for this report.]

**Table 7. Materials Consumed by Kind: 2002 and 1997**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, and explanation of terms, see note 2 at end of table. For meaning of abbreviations and symbols, see introductory text]

Material code	Material consumed	Quantity	Delivered cost (\$1,000)
334412	Bare printed circuit board manufacturing		
00900001	Total materials .....2002..	X	2 431 736
	.....1997..	X	3 075 742
32721203	Tube blanks .....2002..	X	D
	.....1997..	X	1 659
33441200	Printed circuit boards (without inserted components) for electronic circuitry.....2002..	X	306 603
	.....1997..	X	522 536
001900C4	Printed circuit assemblies, loaded boards, and modules (printed circuit boards with inserted electronic components) .....2002..	X	189 518
	.....1997..	X	104 155
33441300	Semiconductors (including transistors, diodes, rectifiers, and integrated circuits), for electronic circuitry .....2002..	X	282 979
	.....1997..	X	122 456
33441400	Capacitors for electronic circuitry .....2002..	X	81 932
	.....1997..	X	37 014
33441500	Resistors for electronic circuitry .....2002..	X	74 148
	.....1997..	X	25 880
001900D3	All other miscellaneous components and accessories, for electronic circuitry (excluding tubes) .....2002..	X	77 623
	.....1997..	X	117 694
32518835	Silicon, hyperpure .....2002..	X	D
	.....1997..	X	D
33141911	Gold and other precious metals, all forms (including ingot, sheet, strip, solder, plating, electrodes, etc.) .....2002..	X	62 534
	.....1997..	X	49 824
33141917	Doped chemicals and other doped materials for electronic use .....2002..	X	31 740
	.....1997..	X	34 373
33111107	Ferrites (powder and paste).....2002..	X	D
	.....1997..	X	138
331000AA	Metal powders .....2002..	X	826
	.....1997..	X	502
33411001	Electronic computer equipment.....2002..	X	11 768
	.....1997..	X	N
33593101	Current-carrying wiring devices.....2002..	X	5 953
	.....1997..	X	2 636
33422001	Electronic communication equipment.....2002..	X	262
	.....1997..	X	D
33451501	Electrical instrument mechanisms and meter movements (including instrument relays) .....2002..	X	3 983
	.....1997..	X	4 193
33451503	All other miscellaneous electrical measuring instruments and parts .....2002..	X	1 671
	.....1997..	X	N
33531211	Fractional horsepower electric motors (less than 1 hp) .....2002..	X	3 477
	.....1997..	X	N
001900B1	Electrical transmission, distribution, and control equipment.....2002..	X	12 032
	.....1997..	X	N
33431005	Loudspeakers, microphones, and tuners (all types) .....2002..	X	54
	.....1997..	X	N
32720003	Glass and glass products (excluding windows and mirrors) .....2002..	X	80 697
	.....1997..	X	N
33331401	Optical instruments and lenses (excluding sighting, tracking, and fire control).....2002..	X	D
	.....1997..	X	D
32521105	Plastics resins consumed in the form of granules, pellets, powders, liquids, etc. ....2002..	X	26 749
	.....1997..	X	15 768
32610011	Fabricated plastics products (excluding gaskets) .....2002..	X	49 594
	.....1997..	X	80 640
332000A9	Sheet metal products (excluding stampings) .....2002..	X	33 359
	.....1997..	X	10 911
332000AC	Metal stampings.....2002..	X	2 025
	.....1997..	X	3 337
33272203	Metal bolts, nuts, screws, washers, rivets, and other screw machine products .....2002..	X	9 036
	.....1997..	X	3 222
33200033	Other fabricated metal products (excluding forgings) .....2002..	X	18 254
	.....1997..	X	16 668
33100035	Castings, rough and semifinished.....2002..	X	D
	.....1997..	X	D
33120001	Steel shapes and forms (excluding castings, forgings, and fabricated metal products) .....2002..	X	D
	.....1997..	X	D
33142111	Copper and copper-base alloy shapes and forms (excluding castings, forgings, and fabricated metal products) .....2002..	X	60 810
	.....1997..	X	44 364
33100038	Aluminum and aluminum-base alloy shapes and forms (excluding castings, forgings, and fabricated metal products) .....2002..	D	D
	.....1997..	X	N
33100082	Other nonferrous metal shapes and forms (excluding aluminum and aluminum-base alloy and copper and copper-base alloy castings, forgings, and fabricated metal products).....2002..	X	3 651
	.....1997..	X	N
331000A7	Insulated wire and cable (including magnet wire) .....2002..	X	6 765
	.....1997..	X	10 025
32220017	Paper and paperboard containers (including shipping sacks and other paper packaging supplies) .....2002..	X	12 126
	.....1997..	X	9 169
32611305	Resists (photosensitive resin films applied to the surface of a wafer) .....2002..	X	45 410
	.....1997..	X	54 814
32512005	Commodity gases .....2002..	X	2 803
	.....1997..	X	897
32518843	Specialty gases.....2002..	X	1 239
	.....1997..	X	385
32599217	Masks .....2002..	X	2 330
	.....1997..	X	6 719
33141957	Silicon chips .....2002..	X	10 914
	.....1997..	X	D
32510074	Solvents.....2002..	X	5 674
	.....1997..	X	N

See footnotes at end of table.

**Table 7. Materials Consumed by Kind: 2002 and 1997—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, and explanation of terms, see note 2 at end of table. For meaning of abbreviations and symbols, see introductory text]

Material code	Material consumed	Quantity	Delivered cost (\$1,000)
334412	Bare printed circuit board manufacturing—Con.		
32561000	Cleaning compounds . . . . .2002..	X	1 336
	1997..	X	N
00970099	All other materials and components, parts, containers, and supplies . . . . .2002..	X	526 417
	1997..	X	850 444
00971000	Materials, ingredients, containers, and supplies, nsk . . . . .2002..	X	286 542
	1997..	X	920 456

Note 1: For some establishments, data have been estimated from central unit values that are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: p—10 to 19 percent estimated; q—20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by S.

Note 2: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.